INSTALLATION/OPERATION

CCC1370H-2, CCC1370H-2X, and MCC1370H-2

1/3-Inch CCD Camera

CE

C1961M-E (8/03)

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IMPORTANT SAFEGUARDS AND WARNINGS

Prior to installation and use of this product, the following WARNINGS should be observed.

1. Installation and servicing should be done only by qualified service and installation personnel.

2. Installation shall be done in accordance with all local and national electrical and mechanical codes utilizing only approved materials.

3. Use only installation methods and materials capable of supporting four times the maximum specified load.

The product may bear the following marks:

This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.

CAUTION:
RISK OF ELECTRIC SHOCK. DO NOT OPEN.

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

Please thoroughly familiarize yourself with the information in this manual prior to installation and operation.

REGULATORY NOTICES

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device many not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

DESCRIPTION

The CCC1370H-2, CCC1370H-2X, and MCC1370H-2 digital cameras are high resolution, compact video cameras that feature a 1/3-inch CCD imager. Each camera's high resolution and high-density image sensor ensure a sharp and clear picture over a wide range of conditions.

MODELS

CCC1370H-2	1/3-inch, high resolution, color CCD camera, 24 VAC, 60 Hz, NTSC
CCC1370H-2X	1/3-inch, high resolution, color CCD camera, 24 VAC, 50Hz/12 VDC, PAL
MCC1370H-2	1/3-inch, high resolution, monochrome CCD camera, 24 VAC, 60 Hz, EIA

LOCATION AND FUNCTION OF PARTS

Refer to Figure 1.

① **Lens Mount**
The camera has a standard CS lens mount but can use a C-mount lens when a C/CS-mount adapter is installed between the lens and camera.

② **Back Focus Lock Screw**
Loosen to adjust the back focus to match the lens attached to the CS mount. Refer to the section on *Back Focus Adjustment* in this manual.

③ **Camera Mounts**
Top or bottom mounting. Maximum thread length is 3/16-inch. Attach the camera mount adapter to extend thread depth to a standard 1/4-inch.

④ **Level Adjuster**
Controls the video output level when using a DC-controlled auto iris lens.

⑤ **Lens Connector**
Four-pin auto iris drive connector.

⑥ **Video Output Connector**
This coaxial connector (BNC type) outputs the video signals.

⑦ **Iris Mode Selector Switch**
Switch to VIDEO when an auto iris lens is controlled by a video signal. Switch to DC when using a DC voltage drive lens.

⑧ **LL ADJ Switches**
Use switches to adjust the vertical phase up or down to eliminate vertical roll when multiple cameras are connected to a switching device. Each camera's output is synchronized to the frequency of the power supply.

⑨ **AGC – Automatic Gain Control**
Automatically adjusts the image to compensate for changes in light levels. The AGC function switch can be turned ON/OFF by moving the AGC switch right or left. AGC is factory set to ON.

⑩ **ESC – Electronic Sensitivity Control**
This function changes the sensitivity of the camera by varying the electronic shutter speed according to the amount of incident light. The ESC range is 1:300. To reset the ESC function switch, move the ON/OFF switch right or left. The ESC is factory set to the ON position.

⑪ **BLC – Backlight Compensation**
The backlight compensation function allows fine picture correction to prevent the subject from being extremely dark due to strong backlight. The BLC function switch can be turned ON/OFF by moving the BLC switch right or left. The BLC is factory set to the OFF position. Set the AGC switch to ON when using the BLC function.

⑫ **Eclipser Function** (NTSC/EIA Models Only)

The eclipser function is used with an auto iris lens. When using a CCD imager with an auto iris lens in an area with minimal lighting contrasts, the auto iris lens closes, resulting in poor picture quality. The eclipser function distorts the signal to the auto iris lens, causing the lens to open wider and create sufficient lighting contrasts to prevent the silhouetting of figures. The eclipser function switch can be turned ON/OFF by moving the ECLP switch right or left. The ECLP is factory set to the OFF position. When the auto iris lens used is equipped with a response selector (AVERAGE/PEAK), always set the selector to AVERAGE.

⑬ **Power Input Terminal**

Three-pin terminal strip, push-in type; 24 VAC for NTSC/EIA models; 24 VAC/12 VDC for PAL model.

⑭ **Eclipser Level Controls** (NTSC/EIA Models Only)

a. Threshold – Sets the level for the brightest part of the picture. Anything brighter than this adjustment will be eclipsed.
b. Eclipse – Sets the brightness of the eclipsed area in the signal that controls the automatic iris lens.
c. Gray – Sets the brightness of the eclipsed area as viewed on a monitor.

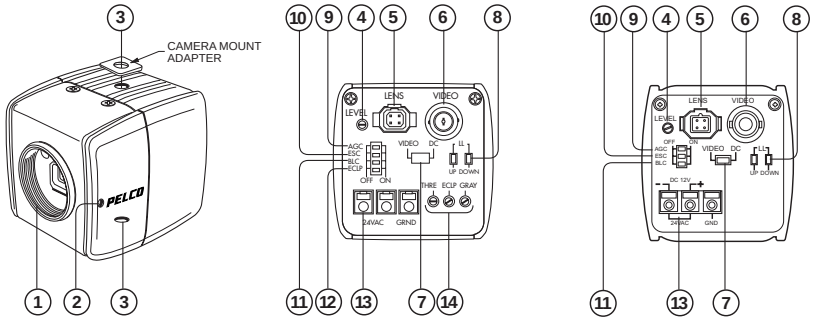


Figure 1. Location and Function of Parts

CONNECTIONS

POWER

To connect to the power supply:

1. Strip at least .50 inch (13 mm) from the power cord to expose the wires.

2. Insert the three wires into the holes in the terminal strip until they snap into place.

3. Confirm that the cord is connected to terminal securely by lightly tugging on the cord.

If you are wiring more than one camera to the same transformer, connect one side of the transformer to the same terminal on all cameras, and connect the other side of the transformer to the remaining terminal on all cameras. Failure to connect all of the cameras the same way will cause the cameras to be out of phase with each other and may produce a vertical roll when switching between cameras.

VIDEO

Connect a video cable to the SIGNAL OUT connector (BNC) on the rear of the camera. Refer to Table A for the type of video coaxial cable to use.

Table A. Video Coaxial Cable Requirements

Cable Type*	Maximum Distance
RG59/U	750 ft (229 m)
RG6/U	1,000 ft (305 m)
RG11/U	1,500 ft (457 m)

*Minimum cable requirements:
75 ohms
All-copper center conductor
All-copper braided shield with 95% braid coverage

LENS INSTALLATION

The CCC1370H-2, CCC1370H-2X, and MCC1370H-2 can use fixed, manual, or passive (DC-controlled) auto iris lenses. The camera has a standard CS lens mount but can use a C-mount lens when a C/CS-mount adapter is installed between lens and camera.

LENS MOUNTING

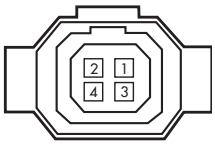
1. Screw the lens onto the lens mount. Be careful to prevent dust from entering the space between the lens and the CCD element. If necessary, use clean, compressed air to remove any foreign matter.

2. Aim the camera and focus the lens to the object or area to be observed.

3. If a manual iris lens is used, adjust the iris for the best picture quality. The largest aperture gives the best light sensitivity, the smallest aperture the greatest depth of field.

AUTO IRIS LENSES

Passive auto iris lenses are DC-controlled via the 4-pin iris drive connector (type D4-152N) located on the back of the camera. Pin connections for the iris drive connector are as follows:



LENS CONNECTOR

PIN	VIDEO SIGNAL CONTROL	DC VOLTAGE CONTROL
1	+9 VDC (40 mA max.)	Control coil (-)
2	+9 VDC (40 mA max.)	Control coil (+)
3	AI - Video	Drive coil (+)
4	GND	Drive coil (-)

BACK FOCUS ADJUSTMENT

Do not release the back focus locking ring unnecessarily. Back focus adjustment has been set at the factory to the standard CS-mount back focus distance. However, once a lens is mounted it may be necessary to adjust back focal length to match the lens being used.

FIXED FOCAL LENGTH LENSES

1. Mount the lens firmly to the camera.

2. With the camera operating, position the camera to view an object at least 30 feet (10 m) away.

3. Set the focus ring to infinity ( ).

4. Set the lens iris to its widest usable opening.

5. Adjust the back focus.
   a. Use an Allen wrench to loosen the back focus lock screw at the side of the camera.

   b. Turn the lens mount to obtain the sharpest image on the monitor.

   c. Turn the back focus locking ring clockwise to tighten.

NOTE: Do not over-tighen the back focus lock screw. Over-tightening the back focus lock screw can damage the threads on the mount of the lens.

MOTORIZED ZOOM LENSES

1. With the camera operating, position the camera to view an object at least 70 feet (25 m) away.

2. Set the lens in the following manner:
   a. Set the lens iris to its widest usable opening.
   b. Set the lens focus to the FAR position.
   c. Adjust lens zoom to WIDE angle.

3. Adjust back focus until the object is in sharpest focus.
   a. Use an Allen wrench to loosen the back focus lock screw at the side of the camera.

   b. Turn the lens mount to obtain the sharpest image on the monitor.

   c. Turn the back focus locking ring clockwise to tighten.

4. Move lens zoom to TELEPHOTO.

5. Zoom out all the way while observing the focus on the monitor (known as “tracking”). If the image stays in focus throughout the entire zoom range, the back focus is correct. Otherwise, repeat the process beginning with step 1.

CAMERA SYNCHRONIZATION

The power supply of each camera is set to the same synchronized phase at the factory and usually does not need to be readjusted.

When using more than one camera power supply, a brief vertical roll may occur on the monitor each time a camera view is switched. To eliminate vertical roll, adjust the phase control by synchronizing, or line locking, the cameras to one another. Use the LL switches on the back of the camera to make adjustments.

It may be necessary to have two people in communication when synchronizing the cameras–one person at the camera and another person at the monitor to observe the vertical roll and the effect of any adjustments made at the camera.

To synchronize the cameras do the following:

1. Choose a camera to which all of the other cameras will be synchronized.
2. Select a second camera that is out of synchronization with the first camera.
3. Adjust the camera phase by pressing the LL switches up or down.
4. Switch the cameras back and forth, observing the roll between the cameras when they are switched.
5. Press the LL switches up or down and observe the roll each time an adjustment is made.
6. Repeat this process as many times as necessary for each camera in the system.

ECLIPSER ADJUSTMENT (NTSC/EIA MODELS ONLY)

The eclipser function is available only on NTSC and EIA models. It is set at the factory and usually does not need to be readjusted. However, if fine tuning is necessary, do the following:

1. Set the DIP switches.
   a. AGC: OFF
   b. ESC: OFF
   c. BLC: OFF

2. Set the IRIS MODE selector.
   a. Auto iris lens controlled by video signal - VIDEO
   b. Auto iris lens controlled by DC voltage - DC

3. Set the variable resistors and Eclipse DIP switch.
   a. THRE: Counterclockwise
   b. ECLP: Mechanical center
   c. GRAY: Mechanical center
   d. ECLIPSER DIP: OFF

4. Set the response selector of the auto iris lens (video type) to AVERAGE. While viewing an object, set the video output level of the camera to 0.75 Vp-p (100 IRE) by adjusting the LEVEL VR of the auto iris lens.

5. While viewing a brightly lit object (Refer to Figure 2):
   a. Set ECLIPSER DIP switch to ON.

   b. Adjust THRESHOLD variable resistor by turning it clockwise. Set the video output level to clip at 0.8~0.85 Vp-p.

c. Set gray level to 0.35 Vp-p by turning the GRAY variable resistor clockwise or counterclockwise.

6. While viewing an object in front of a bright background (refer to Figure 3), adjust the ECLP variable resistor by turning it clockwise or counterclockwise until the foreground is clear (sharp) and the background appears gray.

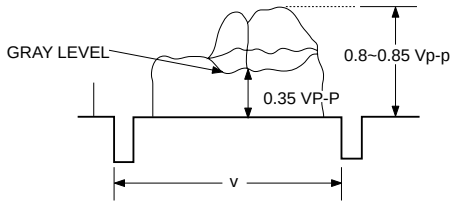


Figure 2. Gray Level Setting

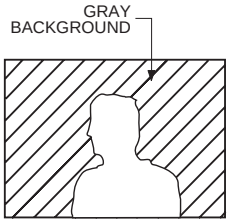


Figure 3. Image on Monitor

SPECIFICATIONS

GENERAL

CCD Sensor:	1/3-inch interline transfer
Picture Elements	
CCC1370H-2, MCC1370H-2:	768H x 494V (approx. 380K)
CCC1370H-2X:	752H x 582V (approx. 440K)
Sensing Area:	3/16 x 1/8 - inch (4.7 mm x 3.5 mm)
Synchronization System	
CCC1370H-2, MCC1370H-2:	AC line lock
CCC1370H-2X:	AC line lock/DC internal
Horizontal Resolution	
CCC1370H-2, CCC1370H-2X:	470 TV lines
MCC1370H-2:	560 TV lines
Iris Control:	Electronic/passive
Minimum Illumination	
CCC1370H-2, CCC1370H-2X:	1.0 lux at f1.2, 75% highlight reflectance, at 2500°K
MCC1370H-2:	0.10 lux at f1.2, 75% highlight reflectance, at 2500°K
ESC:	300:1
Signal-to-Noise Ratio:	>48 dB (AGC off)
Gain Control:	Automatic
Vertical Phase:	+66° +/-90°
Automatic Gain Control:	Selectable
Backlight Compensation:	Selectable
Scanning System	
CCC1370H-2, MCC1370H-2:	525 lines, 2:1 interlace
CCC1370H-2X:	625 lines, 2:1 interlace
Signal Processing:	DSP
Auto Iris Lens Type:	DC/video control
Video Output:	1Vp-p, 75 ohms

PHYSICAL

Dimensions:	2.09 (W) x 2.17 (H) x 2.21 (D) inches (53 x 55 x 56 mm)
Weight (without lens):	0.40 lb (0.20 kg)

ENVIRONMENTAL

Operating Temperature:	14°F to 122°F (-10°C to 50°C)
Storage Temperature:	-40°F to 140°F (-40°C to 60°C)
Humidity:	20 to 80% (non-condensing)

ELECTRICAL

Power Requirements	
CCC1370H-2, MCC1370H-2:	24 VAC, 60 Hz
CCC1370H-2X:	24 VAC, 50 Hz/12 VDC
Power Connector:	3-pin terminal strip, push-in type
Video Connector:	BNC
Lens Jack:	4-pin connector (miniature square)
Current Consumption	
CCC1370H-2:	240 mA
CCC1370H-2X:	270 mA (24 VAC)/ 390 mA (12 VDC)
MCC1370H-2:	220 mA

MECHANICAL

Lens Mount:	C/CS mount (Pelco PCMA40 mount adapter is needed to attach C-mount lens)
Camera Mount:	1/4 x 20, top and bottom of camera housing

POWER SUPPLIES

TF2000:	20 vA power supply, 24 VAC
MCS Series Power Supply:	Power supply for up to 16 cameras, 24 VAC

(Design and product specifications subject to change without notice.)

WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship for a period of one year after the date of shipment. Exceptions to this warranty are as noted below:

- Five years on Pelco manufactured cameras (CC3500/CC3600/CC3700 and MC3500/MC3600 Series); two years on all other cameras.
- Three years on Genex® Series (multiplexers, server, and keyboard) and 090 Series Camclosure® Camera System.
- Two years on 100/150, 200 and 300 Series Camclosure® Camera Systems.
- Two years on all standard motorized or fixed focal length lenses.
- Two years on Legacy®, CM6700/CM6800/CM8500/CM9500/CM9740/CM9760 Matrix, DF5 and DF8 Series Fixed Dome products.
- Two years on Spectra®, Esprit®, and PS20 Scanners, including when used in continuous motion applications.
- Two years on Esprit and WW5700 series window wiper (excluding wiper blades).
- Eighteen months on DX Series digital video recorders.
- One year (except video heads) on video cassette recorders (VCRs). Video heads will be covered for a period of six months.
- Six months on all pan and tilts, scanners or preset lenses used in continuous motion applications (that is, preset scan, tour and auto scan modes).

Pelco will warrant all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to Pelco, Clovis, California. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental or consequential damages (including loss of use, loss of profit and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number
2. Date of shipment, P.O. number, Sales Order number, or Pelco invoice number
3. Details of the defect or problem

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

In order to expedite parts returned to the factory for repair or credit, please call the factory at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair).

All merchandise returned for credit may be subject to a 20% restocking and refurbishing charge.

Goods returned for repair or credit should be clearly identified with the assigned CA or RA number and freight should be prepaid. Ship to the appropriate address below.

If you are located within the continental U.S., Alaska, Hawaii or Puerto Rico:

Service Department
Pelco
3500 Pelco Way
Clovis, CA 93612-5699

If you are located outside the continental U.S., Alaska, Hawaii or Puerto Rico:

Intermediate Consignee
American Overseas Air Freight
320 Beach Road
Burlingame, CA 94010
USA

Ultimate Consignee
Pelco
3500 Pelco Way
Clovis, CA 93612-5699
USA

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PELCO

CCC1370H-2,
CCC1370H-2X, and
MCC1370H-2

Tested to Comply
with FCC Standards

FOR HOME OR OFFICE USE

(CONTROL NO: 1303591011)

REVISION HISTORY

Manual #	Date	Comments
C1961M	11/99	Original version.
C1961M-A	3/01	Add information on model CCC1300H-2X.
C1961M-B	3/01	Revised eclipser adjustment instructions.
C1961M-C	12/01	Revised for enhanced imager; new model numbers.
C1961M-D	12/02	Revised information on model CCC1370H-2X.
C1961M-E	8/03	Corrected specification for minimum illumination.

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